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Case Finding Among and Comprehensive Management of Household Contacts of Persons with Pulmonary Tuberculosis: a Pilot Project — Uganda, 2023–2024

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Abstract

To help achieve the End TB Strategy target of a 90% reduction in tuberculosis (TB) incidence by 2030, member states of the United Nations High-Level Meetings on TB called for improving provision of TB preventive treatment (TPT) for household contacts of persons with TB, who are at increased risk for infection and disease. However, TPT use among household contacts worldwide remained at 21% in 2023. The International Union Against Tuberculosis and Lung Disease, the Uganda Ministry of Health, and CDC piloted a comprehensive approach for increasing case finding and TPT coverage among household contacts of persons with TB. During November 1, 2023–September 30, 2024, a total of 521 index patients with TB disease were registered at six health facilities in Uganda. Home visits to index patients identified 1,913 household contacts, 1,739 (91.0%) of whom underwent TB symptom screening at home; 321 (18.5%) reported TB symptoms. Of 309 (96.3%) persons with TB symptoms who were further evaluated, 284 (91.9%) provided a sputum specimen for laboratory testing, including 270 (84.1% of those with symptoms) who did so during the home visit; 214 (69.3%) underwent chest radiography. Overall, 80 TB cases were diagnosed; in 61 (76.3%) persons, the diagnosis was based on radiographic findings. Among 1,496 HHCs eligible for TPT, 1,239 (82.8%) initiated treatment and 1,178 (95.1%) completed it. Global scale-up of this approach might help reach global TB elimination goals.

Introduction

In 2023, an estimated 10.8 million persons fell ill with tuberculosis (TB), and 1.25 million died from the disease worldwide (*1*). TB risk is increased in household contacts (HHCs) of persons with TB; screening HHCs for TB and providing TB preventive treatment (TPT) are important approaches for achieving the End TB Strategy's target of a 90% reduction in incidence by 2030 (*2*). At the United Nations High-Level Meetings on TB in 2018 and 2023, member states called for improving TPT coverage and committed to providing TPT to 30 million HHCs by 2027. However, in 2023, TPT use among HHCs remained at 21% (*1*). Previous studies (*3*–*6*) have documented suboptimal TB case finding and TPT use among HHCs due to implementation challenges including lack of home visits, indirect symptom screening via index patients, and limited ability to motivate HHCs with presumptive TB to visit health facilities for further evaluation. Programmatic solutions are urgently needed to overcome these challenges.

Uganda is a high TB–incidence country, with 198 cases per 100,000 population each year (*1*). Although national guidelines recommend evaluating all HHCs of persons with pulmonary TB and initiating TPT in those without disease or contraindications regardless of age (*7*), implementation gaps remain (*8*,*9*). This report describes the outcomes of an intervention to increase TB case finding and TPT use among HHCs of persons with pulmonary TB in Uganda.

Continuing Education examination available at https://www.cdc.gov/mmwr/mmwr_continuingEducation.html

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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

Methods

Project Setting and Population

This pilot project was implemented in six high-volume TB clinics in four public and two private, not-for-profit health facilities in Uganda (Supplementary Table 1, https://stacks.cdc.gov/view/cdc/176833#tabs-3), where chest radiography (CXR) could be performed on-site or through referral to a nearby facility. An index TB patient was defined as a person of any age with new or recurrent bacteriologically confirmed pulmonary TB (*7*). An HHC was defined as a person who shared the same enclosed living space with the index patient for ≥1 night, or for frequent or prolonged daytime periods, during the 3 months before the start of current treatment (*10*). All index patients recorded in the selected facilities' TB register during November 1, 2023–September 30, 2024, and their respective HHCs were included.

Case Finding and Management of HHCs with TB Disease

HHCs were managed according to national guidelines (*7*). However, innovations were introduced to overcome the challenges highlighted in previous studies (Figure 1). Training of health care workers[†] emphasized systematic screening of HHCs for TB disease using symptom assessments and CXR (interpreted by computer-assisted diagnosis software or a radiologist). Health care workers received travel and airtime subsidies to conduct home visits and contact HHCs. Home visits included symptom screening, sputum specimen collection for laboratory confirmation[§] among symptomatic HHCs, and HIV testing (after [parental] consent) with rapid diagnostic tests. All HHCs, regardless of symptoms, were referred to facilities for a free-of-charge CXR; their travel costs were reimbursed.

Management of HHCs Without TB Disease

HHCs without TB disease and without contraindications[¶] to preventive treatment were offered TPT. To increase use and adherence, a short-course regimen (1 month of daily isoniazid and rifapentine) was made available, in addition to the 3 months of weekly isoniazid and rifapentine, and 6 months of daily isoniazid options, and intensive counseling sessions on the benefits of TPT were provided. On-site supervision and mentorship on guidelines and project implementation were provided quarterly to health care workers by the International Union Against Tuberculosis and Lung Disease staff members and District TB and Leprosy Supervisors.

[†] TB nurses and community health workers.

[§] A bacteriologically confirmed TB case is one in which a biological specimen is positive by smear microscopy, culture, or molecular World Health Organization–approved rapid diagnostics such as Xpert MTB/RIF.

[¶] Per national guidelines, contraindications include a history of multidrug-resistant TB treatment; acute or chronic liver disease; alcohol dependence; known or suspected hypersensitivity to isoniazid, rifamycin, or other TPT medicines; a history of convulsions or psychosis; moderate or severe peripheral neuropathy; and concomitant medications: anticonvulsants, antifungals, selective serotonin re-uptake inhibitor antidepressants, anticoagulants, and others.

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Data Sources

Structured data collection forms were used to extract project-specific and routinely collected demographic and clinical data from facility records and registers. Follow-up data was included until November 10, 2024.

Data Analysis

Data were analyzed using Stata (version 16.0; StataCorp). Numbers and proportions for each stage of the TB care and TPT cascades were calculated. Means with SDs and medians with IQRs were used to summarize patient demographics and the duration (in days) for completing the various stages.

Ethics

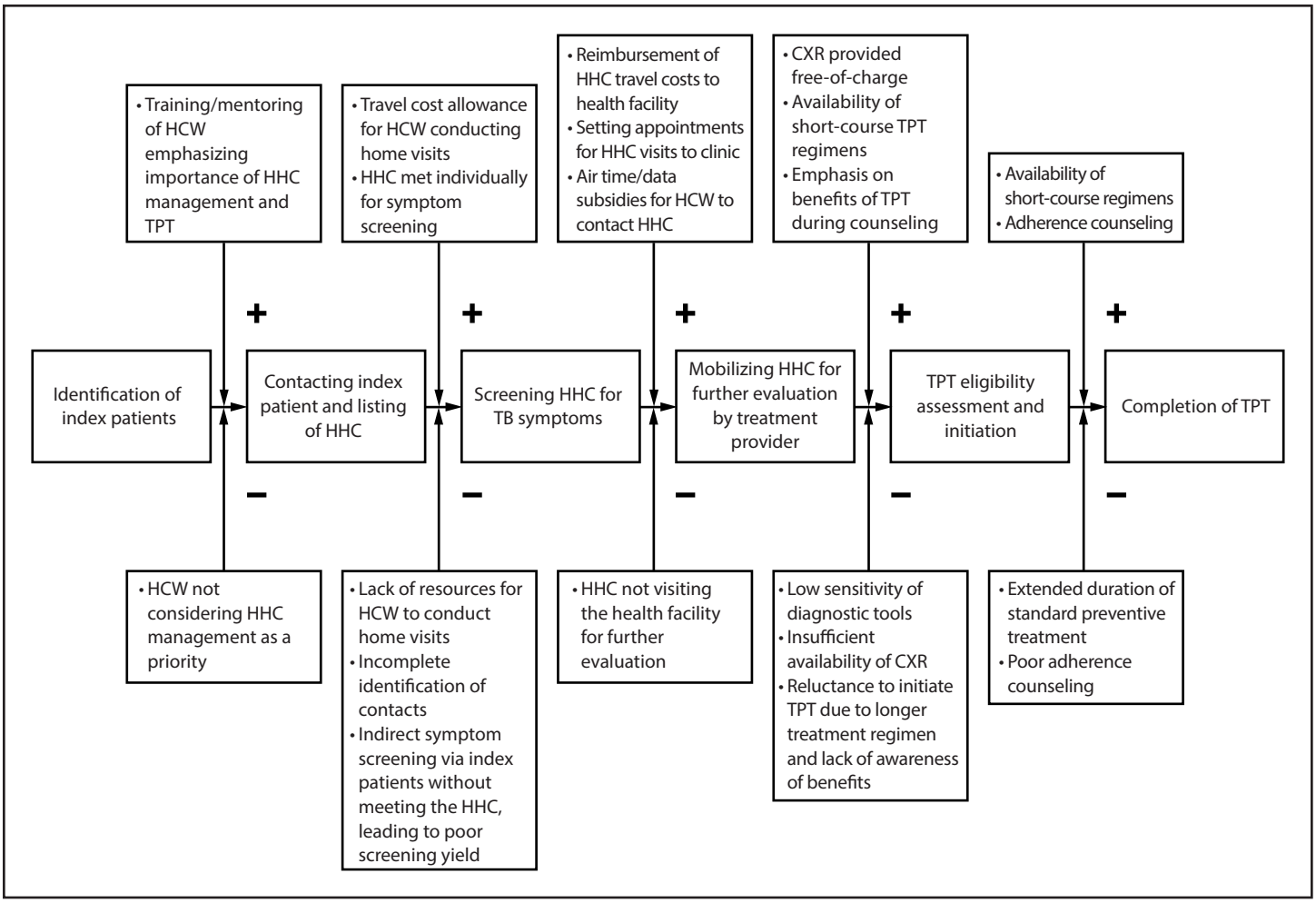
The Uganda Joint Clinical Research Centre's Research Ethics Committee and National Council for Science and Technology granted ethics approval. This activity was reviewed by CDC, deemed not research, and conducted consistent with applicable federal law and CDC policy.**

Results

Of 521 index patients registered in the six selected facilities November 1, 2023–September 30, 2024, 337 (64.7%) were men, 222 (42.6%) were living with HIV, and mean age was 34.6 years (SD = 11.7). Home visits were not possible for 56 (10.7%) index patients who listed 211 HHCs, primarily because they lived outside the facilities' catchment areas. Among 465 (89.3%) index patients visited at home, 1,913 HHCs were identified, including 120 (6.3%) not previously listed by the index patient (Figure 2).

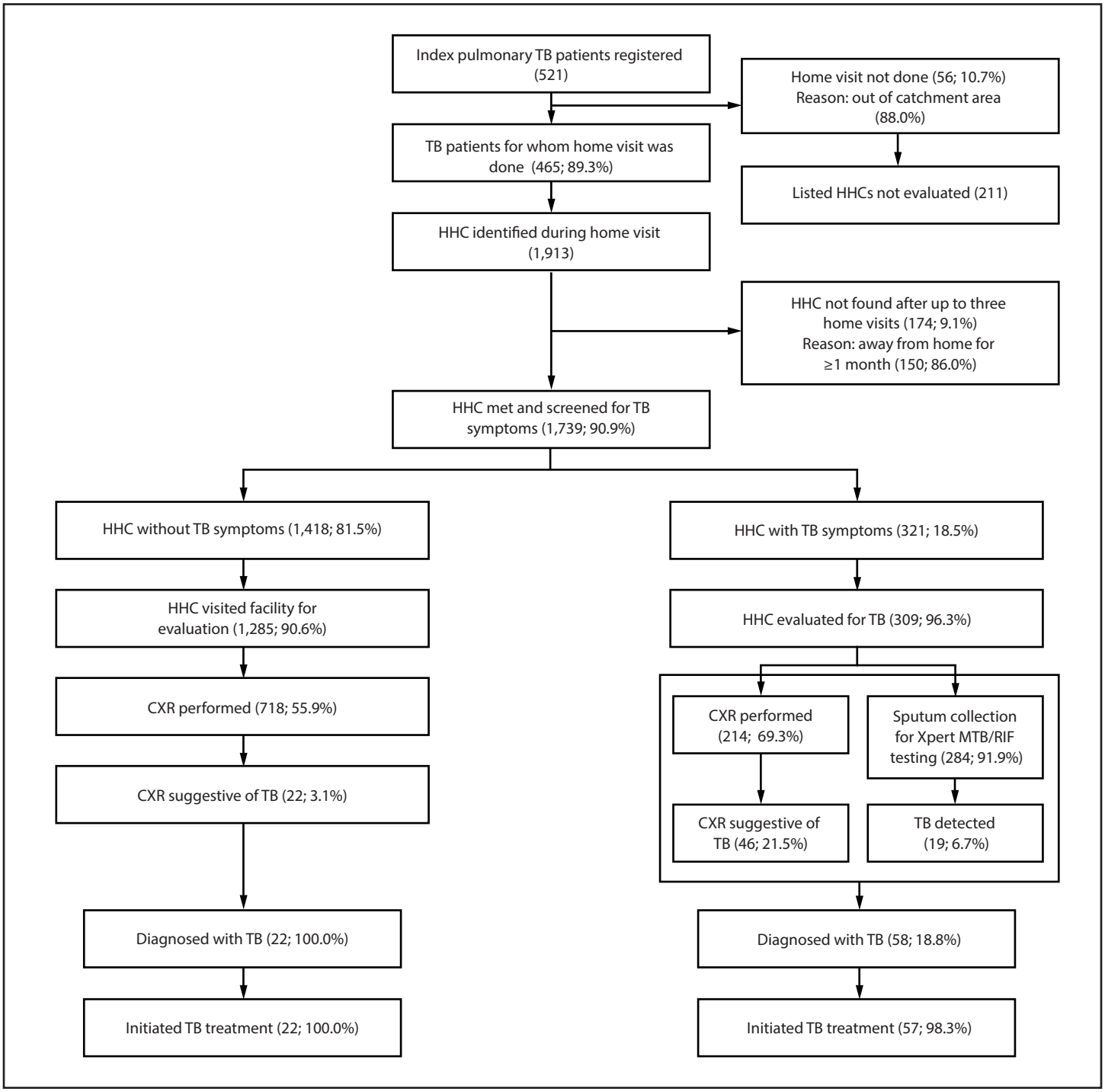
** 45 C.F.R. part 46, 21 C.F.R. part 56; 42 U.S.C. Sect. 241(d); 5 U.S.C. Sect. 552a; 44 U.S.C. Sect. 3501 et seq.

FIGURE 1. Interventions designed to mitigate challenges in the management of household contacts of persons with pulmonary tuberculosis — six health facilities, Uganda, 2023–2024



Abbreviations: CXR = chest radiography; HCW = health care worker; HHC = household contact; TB = tuberculosis; TPT = TB preventive treatment.

FIGURE 2. Tuberculosis diagnosis cascade among household contacts of persons with bacteriologically confirmed pulmonary tuberculosis[*,†,§] initiated on treatment — six health facilities, Uganda, 2023–2024



Abbreviations: CXR = chest radiography; HHC = household contact; TB = tuberculosis; TPT = TB preventive treatment.

* A bacteriologically confirmed TB case is one in which a biological specimen is positive by smear microscopy, culture, or molecular World Health Organization–approved rapid diagnostics such as Xpert MTB/RIF.

† Evaluation for TB disease included symptom screening, a physical examination, CXR, and sputum specimen collection for bacteriologic testing; in asymptomatic patients, collection of a sputum specimen might not be possible.

§ Xpert MTB/RIF results were negative for 20 of 22 asymptomatic HHCs with TB. The clinician made a diagnosis of clinical TB and decided to give the patient a full course of TB treatment on the basis of CXR abnormalities.

Summary

What is already known about this topic?

Household contacts of persons with pulmonary tuberculosis (TB) are at increased risk for infection and disease. Effective interventions to improve TB case finding and to increase use of preventive treatment are lacking.

What is added by this report?

This pilot project enrolled 521 index patients with TB disease at six health facilities in Uganda. Among 1,913 household contacts, 90.9% were screened for TB; 1,239 initiated preventive treatment, approximately 95% of whom completed it. Eighty new cases of TB were diagnosed. The approach included home visits, chest radiography, adherence counseling, and travel reimbursements.

What are the implications for public health practice?

Global scale-up of this household contact approach might help reach global TB elimination goals.

TB Case Finding Among HHCs

Of 1,913 HHCs, 1,739 (90.9%) underwent TB symptom screening at home, 1,490 (85.7%) of whom were aged ≥5 years, and 900 (51.8%) of whom were men (Supplementary Table 2, https://stacks.cdc.gov/view/cdc/176833#tabs-3). During home visits, 1,391 HHCs (80.0%) consented to HIV testing; 48 (3.5%) received a positive test result. Among 472 HHCs of HIV-positive index patients, 37 (7.8%) received a positive test result for the virus.

Of the 1,739 screened HHCs, 321 (18.5%) reported TB symptoms[††], 309 of whom (96.3%) underwent further evaluation; 284 provided a sputum specimen for laboratory confirmation, including 270 (84.1% of symptomatic HHCs) who did so during the home visit, and 214 (69.3%) underwent CXR. Of the 309, 58 (18.8%) received a diagnosis of TB disease, 19 of 58 (32.8%) were bacteriologically confirmed and 39 of 58 (67.2%) were clinically diagnosed.[§§] Fifty-seven (98.3%) initiated TB treatment.

Among 1,418 (81.5%) asymptomatic HHCs, 1,285 (90.6%) visited a health facility for further evaluation; 718 (55.9%) underwent CXR. Of those, 22 (3.1%) had radiologic findings suggestive of TB; 20 received a clinical diagnosis of TB, and two were bacteriologically confirmed. All 22 initiated TB treatment.

Overall, 80 HHCs received a diagnosis of TB disease; CXR contributed to the diagnosis of 61 TB cases. A total of 21 TB cases (two in asymptomatic and 19 in symptomatic HHCs) were bacteriologically confirmed.

Management of HHCs Without TB Disease

Of 1,514 HHCs who visited health facilities and did not receive a diagnosis of TB disease (Figure 3), 1,506 (99.5%) were assessed for TPT eligibility; 1,496 (99.3%) were eligible, and 1,239 (82.8%) initiated self-administered TPT, including 1,123 (91%) who received a short-course regimen. The majority of those who initiated TPT (78.3%) were aged ≥5 years. Of the 257 (17.2%) eligible HHCs who did not initiate TPT, 214 (83.3%) were unable because TPT drugs were out of stock at the health facilities; 35 (13.6%) declined TPT. Overall, 1,178 of 1,239 (95.1%) completed TPT. No severe adverse reactions to TPT drugs were reported.

Median duration from index patient registration to home visit was 1 (IQR = 0–8) day, and 2 days (IQR = 0–12 days) from registration to initiation of TB treatment or TPT (Supplementary Table 3, https://stacks.cdc.gov/view/cdc/176833#tabs-3). Among HHCs initiating TB treatment or TPT, 80.0% did so within 15 days of index patient registration.

Discussion

This pilot project found that providing adequate resources to conduct home visits coupled with spot sputum collection, CXR, adherence counseling, and reimbursements of health care workers for travel and communication resulted in approximately 90% of HHCs of index TB patients being visited and screened for TB. Approximately 90% of symptomatic HHCs were promptly evaluated and 85% had sputum specimens collected during home visits.

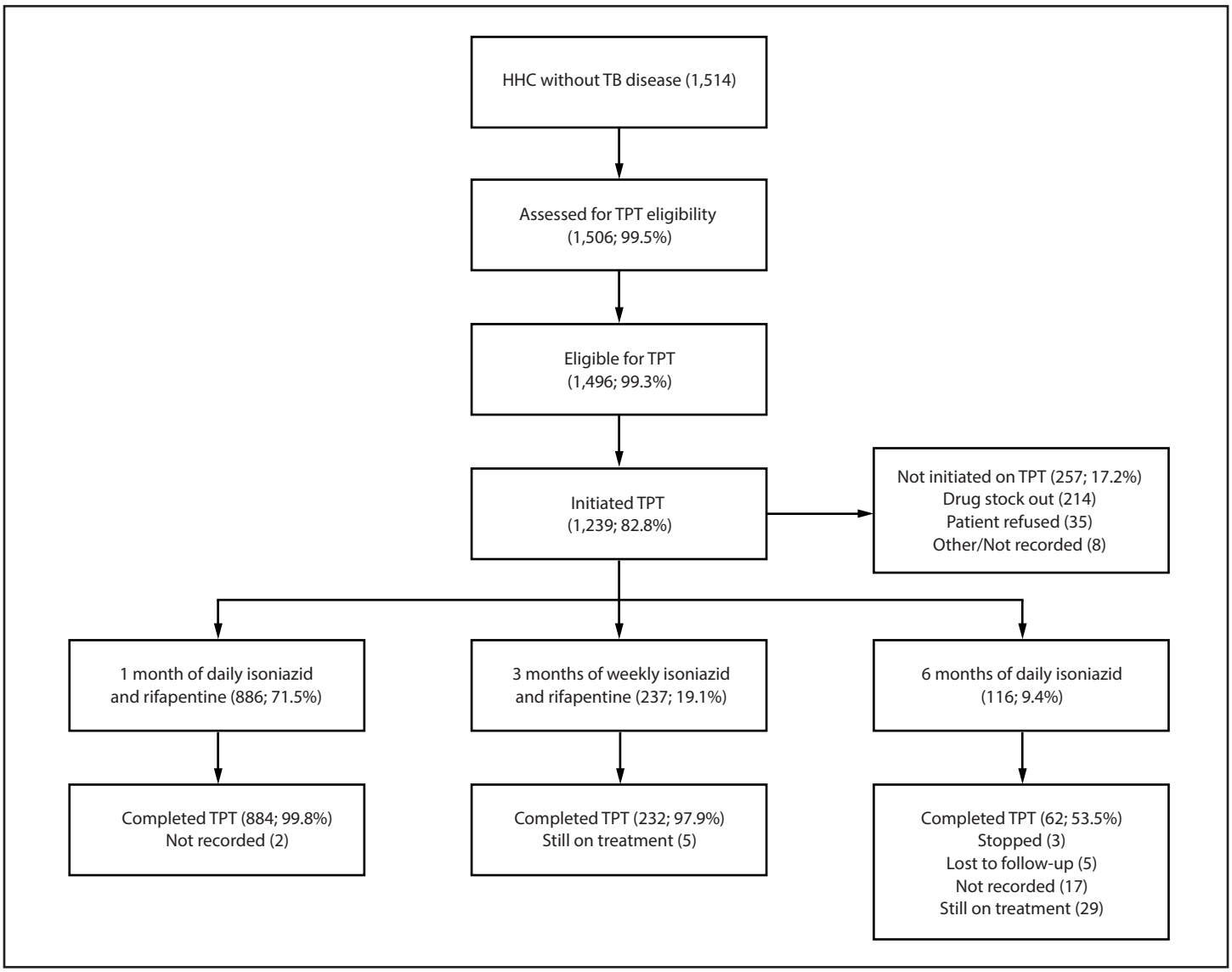
Although efforts to provide access to CXR for asymptomatic HHCs yielded only 50.6% coverage, 22 (3.1% of those who underwent CXR) received a diagnosis of TB. Approximately three fourths of HHCs who received a TB diagnosis would have been missed had CXR not been performed. Screening tools that do not rely on eliciting symptoms, such as CXR, could prove essential to improve global efforts to diagnose asymptomatic TB and expand TPT among HHCs.

Among eligible HHCs, approximately 80% initiated TPT, in contrast with previous studies showing low TPT use (*5*,*6*). Most HHCs who initiated TPT were aged ≥5 years; this observation is encouraging because most programs have traditionally focused interventions for TPT in HHCs aged <5 years (*1*). Approximately 95% of HHCs who initiated TPT completed it, likely due to intensive counseling from health care workers emphasizing the benefits of TPT, availability of shorter TPT regimens, and adherence support during treatment.

[††] Symptoms included current cough, hemoptysis, fever, night sweats, and weight loss (or poor weight gain in children aged <5 years).

[§§] A clinically diagnosed TB case is an illness in a patient who does not fulfill the criteria for bacteriological confirmation but for which the patient has received a diagnosis of active TB by a clinician or other medical practitioner who has decided, based on CXR abnormalities and other clinical considerations, to give the patient a full course of TB treatment.

FIGURE 3. Tuberculosis preventive treatment cascade among household contacts* of persons with bacteriologically confirmed† pulmonary tuberculosis initiated on treatment — six health facilities, Uganda, 2023–2024



Abbreviations: HHC = household contact; TB = tuberculosis; TPT = TB preventive treatment.
* Includes 1,263 HHCs who reported no TB symptoms and 251 who reported symptoms but in whom TB was ruled out.
† A bacteriologically confirmed TB case is one in which a biological specimen is positive by smear microscopy, culture, or molecular World Health Organization–approved rapid diagnostics such as Xpert MTB/RIF.

Limitations

This report is subject to at least two limitations. First, no control sites were included for comparison. Second, TB infection testing was unavailable to assess TPT eligibility. Thus, results reflect a programmatic approach in which HHCs without TB disease were assessed for TPT eligibility regardless of infection status, which might have led to overtreatment.

Implications for Public Health Practice

This project demonstrated an effective intervention for closing gaps in HHC management that could help reach global TB elimination goals. The use of CXR is critical in diagnosing HHCs with TB disease and identifying those eligible for TPT.

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All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. No potential conflicts of interest were disclosed.

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Functional Disability, Violence, HIV Status, and Risk Factors for HIV Among Adolescent Girls and Young Women — Eswatini, 2022

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Abstract

Eswatini has made substantial progress responding to its HIV epidemic and reducing violence against children. However, adolescent girls and young women with disabilities might be at increased risk for experiencing violence and for HIV infection, compared with those without disabilities. Data from the 2022 Eswatini Violence Against Children and Youth Survey were analyzed to compare HIV infection and violence-related measures by functional disability status (e.g., difficulties in performing functional activities such as seeing, walking, or communicating) among adolescent girls and young women. In 2022, in Eswatini, 14.0% of adolescent girls and young women aged 13–24 years had a reported functional disability. Compared with those without a functional disability, adolescent girls and young women with a functional disability had higher lifetime prevalences of experiencing sexual, physical, and emotional violence. They were also more likely to know where to seek help for experiences of violence. After adjusting for sociodemographic characteristics, HIV testing and infection status, HIV risk factors, sexual risk behaviors, and HIV treatment and prevention services did not differ by functional disability status. Prioritizing accessible, disability-inclusive prevention programs and services might help reduce experiences of violence among adolescent girls and young women with disabilities. Partnering with disability-led and disability-serving organizations and directly with adolescent girls and young women with disabilities to plan and implement programs and services that are disability-inclusive could help ensure that adolescent girls and young women with disabilities are aware of and can access these resources.

Introduction

Eswatini has made substantial progress in HIV epidemic control and in reducing violence against children (*1*,*2*). However, certain populations remain particularly vulnerable to HIV infection and violence. Adolescent girls and young women in Eswatini are disproportionately affected by HIV, with an estimated prevalence of HIV infection among those aged 15–24 years (11.0%) that is more than three times that among male peers (3.4%) (*2*). Adolescent girls and young women with disabilities are particularly at risk for violence and HIV infection because of physical or communication barriers to accessing HIV prevention, testing, and treatment services, in addition to economic vulnerabilities, exclusion from education, and discrimination (*3*–*5*). This report describes self-reported functional disability prevalence (difficulties in performing functional activities [e.g., seeing, walking, or communicating]) (*6*) and the association with HIV and violence-related measures among adolescent girls and young women aged 13–24 in Eswatini. Findings could be used to improve service delivery and better understand the risks and needs of adolescent girls and young women with disabilities.

Methods

Data Source

Data from 6,318 adolescent girls and young women aged 13–24 years who participated in the 2022 Eswatini Violence Against Children and Youth Survey (VACS) were analyzed (female response rate = 90.1%). VACS is a cross-sectional, nationally representative household survey of persons aged 13–24 years that collects data on experiencing violence, HIV infection, and risk and protective factors for violence and HIV infection (*1*). Participation in VACS is voluntary, and for participants aged 13–17 years, parental permission and assent from the participant are obtained; for those aged ≥18 years, participant consent is obtained. Sex-matched interviewers conduct the interviews and record responses electronically using tablets. Forty-nine persons with severe disabilities or challenges in understanding or responding to questions were excluded. A comprehensive response plan and referral protocol was in place for participants who needed referrals during or after the survey, including those who recently experienced violence (*1*).

Disability Measures

Functional disability status was assessed using a modified version of the Washington Group on Disability Statistics Short Set (WG-SS) on Functioning questionnaire (*6*) (Supplementary Table, https://stacks.cdc.gov/view/cdc/176833#tabs-3). This analysis considered adolescent girls and young women to have a disability if they responded, "some difficulty," "a lot of difficulty," or "cannot do at all" to at least one question assessing six domains of current functioning: vision, cognition, mobility,

self-care, independent living,* and communication.† Because the ability to hear an interviewer is required for participation in an interviewer-administered survey, the WG-SS question on hearing was not included in the Eswatini VACS.

Violence-Related Measures

Violence-related measures included lifetime experiences of sexual, physical, and emotional violence; knowledge of a place to go for help for experiences of violence and to seek help for sexual and physical violence; having sought professional services for sexual and physical violence; and having received professional services for experiences of sexual and physical violence.

HIV Testing, Prevention, and Treatment Measures

HIV testing and infection status measures included ever having been tested for HIV infection, tested positive for HIV, and knowing one's HIV infection status. HIV status was ascertained either via self-report of a previous positive HIV test result or positive rapid HIV test result at the time of the VACS interview. HIV testing was offered using the national HIV rapid testing algorithm (*1*). HIV prevention measures and treatment included knowledge of and ever having taken pre-exposure or postexposure prophylaxis, and among adolescent girls and young women living with HIV, being on antiretroviral therapy and viral load suppression.

HIV Infection Risk Factors and Sexual Risk Behaviors

HIV risk factors and sexual risk behaviors included lifetime experience of transactional sex, ever having symptoms or received a diagnosis of a sexually transmitted infection, forced sexual initiation, early sexual debut; and any of the following during the previous 12 months: multiple sexual partners, infrequent condom use (sometimes or never using condoms), positive or unknown HIV status of sex partners, sex partners who were ≥5 years older than the respondent, partners who ever refused to wear a condom, and fear of experiencing violence from disclosure of HIV status if the respondent received a positive HIV test result. Because of complex skip patterns used in VACS (i.e., each respondent could receive a different sequence of questions based on prior responses), indicator denominators might differ. All measures were dichotomized (i.e., yes or no) and self-reported during face-to-face interviews.

Data Analysis

Prevalence estimates were calculated for number of functional disabilities, functional disability status, and sociodemographic characteristics and HIV and violence-related measures by functional disability status. Rao-Scott chi-square tests were used to assess differences in sociodemographic characteristics by functional disability status, with p-values <0.05 considered statistically significant. Associations between functional disability status (independent variable) and HIV and violence-related measures (dependent variables) were assessed in separate unadjusted and adjusted logistic regression models, which generated prevalence ratios (PRs) comparing HIV and violence-related measures by disability status.§ To adjust for potential confounders of the association between functional disability and the different measures, adjusted analyses controlled for sociodemographic variables that reflect potential social and environmental influences (age, education, food insecurity,¶ orphan status,** marital status, and residence††). To account for multiple statistical tests, a Bonferroni-corrected significance level of p<0.0017 was used for regression analyses. Survey weights were included for all analyses. Analyses were conducted using SAS (version 9.4; SAS Institute), accounting for the complex survey design. This activity was reviewed by CDC, deemed not research, and was conducted consistent with applicable federal law and CDC policy.§§

Results

Functional Disability Prevalence

Among adolescent girls and young women aged 13–24 years in Eswatini, 14% have a self-reported functional disability, with 11.2% reporting one functional disability type and 2.8% reporting two or more types (Table 1). The most commonly reported functional disability domain was vision (6.7%).

Associations of Violence and HIV Measures with Functional Disability

No differences were observed in characteristics between adolescent girls and young women aged 13–24 years with versus without functional disability except more of those with a functional disability experienced food insecurity (67.0% versus 59.7%; p = 0.002) (Table 2). After adjusting for sociodemographic characteristics, adolescent girls

* Independent living is not included in the WG-SS. A modified version (for country-specific daily errands) of the American Community Survey question on independent living was included in the Eswatini VACS. https://www.census.gov/topics/health/disability/guidance/data-collection-acs.html

† Disability prevalence can be estimated at different cutpoints using WG-SS. The generally recommended threshold for comparing disability prevalence across countries is "a lot of difficulty" or "cannot do at all" for any domain. Under this threshold, the prevalence of functional disability was low (1.7%), resulting in small sample size to allow the comparison of disability status by the outcomes of interest for this analysis.

§ An SAS macro was used to calculate weighted and unweighted prevalence ratios using logistic regression. Sensitivity analyses were run using the SAS (version 9.4; SAS Institute) macro proc genmod to calculate unadjusted prevalence ratios and results were consistent.

¶ Household did not have enough money for food.

** Lost one or both parents before age 18 years.

†† Lives in an urban or rural area.

§§ 45 C.F.R. part 46, 21 C.F.R. part 56; 42 U.S.C. Sect. 241(d); 5 U.S.C. Sect. 552a; 44 U.S.C. Sect. 3501 et seq.

TABLE 1. Prevalence of functional disability among adolescent girls and young women aged 13–24 years, by disability domain (N = 6,318) — Violence Against Children and Youth Survey, Eswatini, 2022

Functional disability	No., unweighted	Weighted % (95% CI)
Functional disability domain*		
Vision	404	6.7 (5.7–7.7)
Cognition	181	3.0 (2.3–3.7)
Mobility	161	2.9 (2.2–3.6)
Self-care	60	0.9 (0.6–1.1)
Independent living†	86	1.5 (1.1–1.9)
Communication	180	2.8 (2.2–3.5)
Number of functional disabilities		
None	5,465	86.0 (84.5–87.5)
One	690	11.2 (10.0–12.4)
Two or more	163	2.8 (2.2–3.5)
Functional disability status		
Functional disability in at least one functional domain	853	14.0 (12.5–15.5)
No functional disability in any domain	5,465	86.0 (84.5–87.5)

* Self-reported, "some difficulty," "a lot of difficulty," or "cannot do at all" to one or more functional disability domains (vision, cognition, mobility, self-care, independent living, or communication). Because the ability to hear an interviewer is required for participation in an interviewer-administered survey, the Washington Group Short Set on Functioning question on hearing was not included in the Eswatini Violence Against Children and Youth Survey.

† Independent living is not included in the Washington Group on Disability Statistics Short Set on Functioning questionnaire. A modified version (for country-specific daily errands) of the American Community Survey question on independent living was included in the Eswatini Violence Against Children and Youth Survey. https://www.census.gov/topics/health/disability/guidance/data-collection-acs.html

TABLE 2. Selected characteristics among adolescent girls and young women aged 13–24 years, by functional disability status (N = 6,318) — Violence Against Children and Youth Survey, Eswatini, 2022

Characteristic	No., unweighted	Weighted % (95% CI)			Chi-square p-value†
		Total	With functional disability*	Without functional disability	
Age group, yrs					
13–17	3,127	**44.4 (42.7–46.1)**	46.0 (42.2–49.7)	44.2 (42.3–46.0)	0.39
18–24	3,191	**55.6 (53.9–57.3)**	54.0 (50.3–57.8)	55.8 (54.0–57.7)	0.39
Education§					
Primary school or less	1,183	**17.6 (16.3–19.0)**	19.5 (15.9–23.1)	17.3 (16.0–18.7)	0.23
At least some secondary school	5,132	**82.4 (81.0–83.7)**	80.5 (76.9–84.1)	82.7 (81.3–84.0)	0.23
Experienced food insecurity¶	3,656	**60.7 (58.5–62.9)**	67.0 (62.7–71.3)	59.7 (57.3–62.0)	0.002
Orphan**	1,663	**28.0 (26.5–29.5)**	28.2 (24.4–32.0)	28.0 (26.4–29.5)	0.90
Ever been married or lived with someone as if married	357	**6.0 (5.2–6.8)**	5.6 (3.6–7.5)	6.1 (5.2–7.0)	0.65
Residence††					
Urban	939	**14.5 (12.3–16.7)**	14.6 (9.1–20.2)	14.5 (12.4–16.7)	0.98
Rural	5,379	**85.5 (83.3–87.7)**	85.4 (79.8–90.9)	85.5 (83.3–87.6)	0.98

* Self-reported, "some difficulty," "a lot of difficulty," or "cannot do at all" in one or more functional disability domains (vision, cognition, mobility, self-care, independent living, or communication). Because the ability to hear an interviewer is required for participation in an interviewer-administered survey, the Washington Group Short Set on Functioning question on hearing was not included in the Eswatini Violence Against Children and Youth Survey.

† Rao-Scott chi-square test comparing sociodemographic characteristics by disability status; p-values <0.05 indicate statistical significance.

§ Highest level of schooling completed.

¶ Household did not have enough money for food.

** Lost one or both parents before age 18 years.

†† Lives in an urban or rural area.

and young women with a functional disability had a higher prevalence of experiencing lifetime sexual violence (adjusted prevalence ratio [aPR] = 2.0), physical violence (aPR = 1.7), and emotional violence (aPR = 2.2) versus those without a functional disability (Table 3). Adolescent girls and young women with versus without a functional disability were more likely to know of a place to go for help for experiences of violence (aPR = 1.2). Prevalence ratios of measures related to HIV testing and infection status, HIV risk factors, sexual risk behaviors, and HIV treatment and prevention services did not differ by disability status.

Discussion

In Eswatini in 2022, 14% of adolescent girls and young women aged 13–24 years had a self-reported functional disability. Those with a functional disability had a higher lifetime prevalence of experiencing sexual, physical, and emotional violence compared with those without a disability. These findings are consistent with previous studies that found a relationship between disability and experiencing violence (*3*,*5*). Adolescent girls and young women with versus without functional disabilities were also more likely to experience food insecurity, an economic vulnerability that might contribute to increased risk for experiencing violence (*7*). In addition, adolescent girls and young women with a functional disability were more likely to know where to go to seek help services for experiencing violence, potentially because of their increased likelihood of experiencing violence or engagement with health systems where violence referral services might be shared or co-located. However, the extent to which these services are accessible and disability-inclusive is unknown. An analysis of the 2018 Lesotho VACS identified relationships between disability and HIV and risk behaviors (*5*). However, in the current study, disability was not associated with HIV infection status or risk behaviors after adjusting for age, education, food insecurity, orphan status, marital status, and residence. Further investigation is needed to better understand how these factors might modify the relationship between disability and HIV infection status.

Increased prevalences of experiencing sexual, physical, and emotional violence among adolescent girls and young

TABLE 3. Prevalence of experiences of violence, HIV testing and infection status, HIV risk factors and sexual risk behaviors, and use of HIV prevention methods and treatment among adolescent girls and young women aged 13–24 years,* by functional disability status and prevalence ratios comparing prevalence among adolescent girls and young women with and without a functional disability — Violence Against Children and Youth Survey, Eswatini, 2022

Characteristic	Functional disability status: With functional disability† No., unweighted	With functional disability† Weighted % (95% CI)	Without functional disability No., unweighted	Without functional disability Weighted % (95% CI)	PR (95% CI)	p-value§	aPR¶ (95% CI)	p-value§
Experience of violence								
Lifetime experience of sexual violence	115	14.4 (11.0–17.8)	372	7.1 (6.0–8.1)	2.0 (1.5–2.6)	<0.001	2.0 (1.5–2.6)	<0.001
Lifetime experience of physical violence	154	16.5 (13.5–19.6)	507	9.5 (8.1–10.8)	1.7 (1.3–2.1)	<0.001	1.7 (1.3–2.0)	<0.001
Lifetime experience of emotional violence	298	35.9 (30.7–41.2)	866	15.5 (13.7–17.3)	2.3 (1.9–2.7)	<0.001	2.2 (1.8–2.6)	<0.001
Knew of a place to seek help for experiences of violence	577	67.9 (63.3–72.6)	3,293	59.9 (57.1–62.7)	1.1 (1.0–1.2)	0.004	1.2 (1.1–1.3)	<0.001
Knew of a place to seek help for experiences of sexual violence**	71	58.4 (48.1–68.7)	189	47.9 (41.9–53.8)	1.2 (1.0–1.5)	0.09	1.2 (1.0–1.5)	0.07
Sought professional services for any experience of sexual violence**	35	27.2 (16.1–38.3)	96	25.2 (19.9–30.5)	1.1 (0.6–1.6)	0.75	1.0 (0.5–1.5)	0.97
Received professional services for any experience of sexual violence**	29	24.1 (13.3–34.8)	82	22.8 (17.6–28.0)	1.1 (0.5–1.6)	0.83	1.0 (0.5–1.5)	0.96
Knew of a place to seek help for physical violence††	104	68.0 (59.6–76.4)	350	67.9 (61.8–74.1)	1.0 (0.9–1.1)	0.99	1.0 (0.9–1.1)	0.81
Sought professional services for any experience of physical violence††	52	32.0 (22.2–41.7)	171	31.3 (25.8–36.7)	1.0 (0.7–1.4)	0.91	1.1 (0.7–1.4)	0.79
Received professional services for any experience of physical violence††	32	19.6 (12.5–26.6)	103	17.7 (13.8–21.7)	1.1 (0.6–1.6)	0.65	1.2 (0.7–1.7)	0.47
HIV testing and infection status								
Ever tested for HIV infection	657	78.9 (75.5–82.3)	4,203	78.5 (76.9–80.1)	1.0 (1.0–1.1)	0.83	1.0 (1.0–1.0)	0.75
Received positive HIV test result§§	69	9.3¶¶ (6.5–12.1)	347	6.2*** (5.4–7.0)	1.5 (1.0–2.0)	0.04	1.3 (0.9–1.7)	0.17
Knew HIV infection status†††	61	80.6 (62.3–99.0)	314	90.4 (86.9–93.8)	0.9 (0.7–1.1)	0.30	1.0 (0.9–1.1)	0.70
HIV risk factors and sexual risk behaviors								
Lifetime experience of transactional sex§§§	30	5.4 (3.3–7.6)	168	6.9 (5.5–8.4)	0.8 (0.4–1.1)	0.23	0.8 (0.5–1.2)	0.38
Ever had symptoms or a diagnosis of an STI§§§	64	15.5 (10.8–20.2)	261	11.6 (9.6–13.7)	1.3 (0.9–1.8)	0.16	1.3 (0.9–1.8)	0.15
Experienced forced sexual initiation§§§	76	17.1 (12.2–21.9)	367	16.6 (14.2–19.0)	1.0 (0.7–1.4)	0.86	1.1 (0.8–1.4)	0.59
Early sexual debut¶¶¶	37	8.6 (5.3–11.9)	227	9.4 (7.8–11.0)	0.9 (0.5–1.3)	0.67	1.0 (0.6–1.3)	0.89
Multiple sexual partners (two or more partners during previous 12 months)****	30	7.4 (4.6–10.3)	155	7.5 (6.1–9.0)	1.0 (0.6–1.4)	0.95	1.0 (0.5–1.4)	0.92
Sex partner ≥5 years older****	80	22.1 (16.2–27.9)	566	26.6 (24.3–29.0)	0.8 (0.6–1.1)	0.13	0.9 (0.7–1.1)	0.31
Partner ever refused to wear a condom****	49	14.5 (8.4–20.6)	367	16.7 (14.5–18.9)	0.9 (0.5–1.2)	0.45	0.8 (0.5–1.0)	0.10
Infrequent condom use during previous 12 months****	159	44.4 (37.4–51.4)	920	45.9 (43.0–48.9)	1.0 (0.8–1.1)	0.70	0.9 (0.7–1.1)	0.39
HIV infection status of sex partner is positive or unknown****	89	24.9 (19.4–30.3)	551	26.9 (24.5–29.2)	0.9 (0.7–1.1)	0.47	0.9 (0.8–1.1)	0.59
Fear of experiencing violence from disclosure of HIV status if HIV test result is positive††††	56	23.3 (15.1–31.4)	216	15.5 (12.5–18.4)	1.5 (0.9–2.1)	0.09	1.5 (0.9–2.1)	0.12

See table footnotes on the next page.

women with functional disabilities highlights the need for accessible and disability-inclusive prevention programming and services to promote continued progress in addressing violence in Eswatini. Preventing experiences of violence among adolescent girls and young women with disabilities aligns with efforts set forth by the Eswatini government (*8,9*) to advance the inclusion of persons with disabilities in violence prevention programs and services and ending violence, stigma, and discrimination.

TABLE 3. (*Continued*) Prevalence of experiences of violence, HIV risk factors and sexual risk behaviors, HIV testing and infection status, and use of HIV prevention methods and treatment among adolescent girls and women aged 13–24 years,* by functional disability status and prevalence ratios comparing prevalence among adolescent girls and women with and without a functional disability — Violence Against Children and Youth Survey, Eswatini, 2022

Characteristic	Functional disability status				PR (95% CI)	p-value§	aPR¶ (95% CI)	p-value§
	With functional disability†		Without functional disability					
	No., unweighted	Weighted % (95% CI)	No., unweighted	Weighted % (95% CI)				
HIV prevention methods and treatment								
Ever heard of PEP§§§§	294	36.9 (32.1–41.7)	2,235	41.0 (38.4–43.5)	0.9 (0.8–1.0)	0.10	0.9 (0.8–1.0)	0.08
Ever heard of PrEP¶¶¶¶	387	48.8 (44.1–53.5)	2,746	51.3 (48.8–53.8)	1.0 (0.9–1.0)	0.29	0.9 (0.8–1.1)	0.34
Ever taken PEP*****	29	9.4 (5.3–13.6)	240	11.2 (9.3–13.0)	0.8 (0.4–1.2)	0.43	0.9 (0.5–1.3)	0.50
Ever taken PrEP††††	32	12.6 (7.4–17.8)	288	17.7 (14.8–20.5)	0.7 (0.4–1.0)	0.06	0.7 (0.4–1.0)	0.05
On antiretroviral therapy§§§§§	54	90.5 (81.2–99.7)	291	93.4 (90.2–96.7)	1.0 (0.9–1.1)	0.54	1.0 (1.0–1.0)	0.83
Viral load suppression¶¶¶¶¶	25	53.5 (35.1–71.9)	152	57.7 (50.3–65.0)	0.9 (0.6–1.3)	0.67	0.9 (0.7–1.2)	0.69

Abbreviations: aPR = adjusted prevalence ratio; PEP = postexposure prophylaxis; PR = prevalence ratio; PrEP = pre-exposure prophylaxis; STI = sexually transmitted infection; VACS = Violence Against Children and Youth Survey.

* Because of the complex skip patterns used in the VACS, indicator denominators might differ.
† Self-reported, "some difficulty," "a lot of difficulty," or "cannot do at all" to one or more functional disability domains (vision, cognition, mobility, self-care, independent living, or communication). Because the ability to hear an interviewer is required for participation in an interviewer-administered survey, the Washington Group Short Set on Functioning question on hearing was not included in the Eswatini VACS.
§ Estimates were considered statically significant if Bonferroni-corrected p-values <0.0017.
¶ Adjusted for age, education, food insecurity, orphan status, marital status, and residence.
** Among adolescent girls and young women who experienced sexual violence.
†† Among adolescent girls and young women who experienced physical violence.
§§ Includes those who self-reported a previous positive HIV test result as well as those who received a positive rapid HIV test result at the time of the VACS.
¶¶ 7.5% self-report receiving a previous positive HIV test result, and 1.8% had a positive rapid HIV test result at the time of the VACS interview.
*** 5.6% self-report receiving a previous positive HIV test result, and 0.6% had a positive rapid HIV test result at the time of the VACS interview.
††† Among adolescent girls and young women who have received a positive HIV test result.
§§§ Among adolescent girls and young women who ever had sex.
¶¶¶ Among adolescent girls and young women aged ≥16 years who ever had sex.
**** Among adolescent girls and young women who had sex during the past 12 months.
†††† Among adolescent girls and young women who had sex during the past 12 months and have received a negative HIV test result.
§§§§ In the questionnaire, PEP is described as follows: "When a person who is HIV-negative takes HIV medicine after a single exposure (such as an unwanted or forced sex experience) to reduce their chances of getting HIV, this is called postexposure prophylaxis, or PEP."
¶¶¶¶ In the questionnaire PrEP is described as follows: "'PREP' or pre-exposure prophylaxis, involves taking HIV medicine to reduce the chance of getting HIV."
***** Among adolescent girls and young women who have ever heard of PEP.
††††† Among adolescent girls and young women aged ≥16 years who ever had sex and had heard of PrEP.
§§§§§ Among adolescent girls and young women who knew they were living with HIV infection.
¶¶¶¶¶ Among adolescent girls and young women who are on antiretroviral treatment and have taken a viral load test.

Limitations

The findings in this report are subject to at least seven limitations. First, self-reported data might be subject to recall, social desirability, or other biases. Second, because VACS are cross-sectional surveys, results cannot be interpreted as being causal or directional. Third, the Bonferroni correction is conservative, and some significant findings might have been missed using the Bonferroni-corrected significance level (e.g., the relationship between disability and HIV infection status). Fourth, including "some difficulty" in the disability categorization might bias results toward the null, because adolescent girls and young women with lesser degrees of functional limitations were included as having a disability. Fifth, because of small response numbers, it was not possible to assess differences in outcomes by disability type or degree of functional limitation, which would be helpful for focusing interventions within a heterogeneous population. Sixth, exclusion of persons with severe disabilities or challenges in understanding or responding to questions might have limited the inclusion of persons with a high degree of functional limitations. Therefore, disability prevalence is an underestimate and results might not be generalizable to that population of adolescent girls and young women. Finally, since hearing disability was not assessed in the Eswatini VACS, adolescent girls and young women with only this disability type would have been excluded when assessing disability.

Summary

What is already known about this topic?

Eswatini has made substantial progress in addressing its HIV epidemic and violence against children. However, adolescent girls and young women, particularly those with disabilities, might remain at risk for HIV infection and for experiencing violence.

What is added by this report?

In Eswatini, adolescent girls and young women aged 13–24 years with functional disabilities (difficulties in performing activities) had higher prevalences of experiencing sexual, physical, and emotional violence, but in adjusted analyses, disability was not associated with higher prevalence of HIV infection.

What are the implications for public health practice?

Collaboration between disability-serving organizations and violence prevention partners across health, education, and social welfare sectors might help reach priority populations and provide disability-inclusive violence prevention programming.

Implications for Public Health Practice

Understanding risk factors for experiencing violence by adolescent girls and young women with disabilities might help guide development and implementation of tailored violence prevention programs and services. Prioritizing accessible and disability-inclusive violence prevention programs and service delivery might help reduce experiences of violence among adolescent girls and young women with disabilities (*5*). In addition, violence prevention partners collaborating with disability-led and disability-serving organizations and directly with adolescent girls and young women with disabilities to plan and implement programs and services that are disability-inclusive could help ensure that adolescent girls and young women with disabilities are aware of and can access these resources.

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Notes from the Field

Rhodesiense Human African Trypanosomiasis (Sleeping Sickness) in a Traveler Returning from Zimbabwe — United States, August 2024

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Human African trypanosomiasis (HAT), also known as sleeping sickness, is a vectorborne disease caused by two subspecies of the parasitic protozoan *Trypanosoma brucei: T.b. gambiense* and *T.b. rhodesiense*. Both are transmitted by the bite of the tsetse fly, but they differ in epidemiology and disease progression. *T.b. gambiense* is found in west and central Africa and accounts for approximately 92% of HAT cases globally, while *T.b. rhodesiense* is found in east and south Africa and is often the cause of HAT in short-term travelers to endemic regions (*1*). *T.b. gambiense* causes a slowly progressive form of HAT, with symptoms developing over months to years, while *T.b. rhodesiense* causes an acute and quickly progressive form of the disease.

Domestic cattle and several big-game animals are reservoirs for *T.b. rhodesiense** (*1*,*2*). During the first stage of rhodesiense HAT, which is rapidly progressive over weeks, the parasite multiplies in the blood and lymphatic system, causing symptoms including fever, hemolysis and anemia, thrombocytopenia, hepatosplenomegaly, and renal disease. In the second stage of disease, the parasite crosses the blood-brain barrier, causing central nervous system (CNS) dysfunction, followed by death within weeks to months (Box). Updated 2024 World Health Organization (WHO) guidelines recommend oral fexinidazole for treatment of first and second stage rhodesiense HAT (*3*). Approximately 90% of cases are fatal without treatment; therefore, prompt identification of trypanosomes and early treatment is critical. Parasite burden is high in rhodesiense HAT; because relapse is possible if treatment fails to eliminate all parasites, WHO recommends follow-up at 3, 6, and 12 months after treatment (*3*).

T.b. rhodesiense is endemic in 13 countries.† Since 2011, reported rhodesiense HAT cases have been steadily declining, with only 24 cases reported in 2023. Published literature describes fewer than 30 cases in short-term travelers from countries without endemic disease since 2011 (*4*,*5*). Because *T.b. rhodesiense* is maintained in animal rather than human reservoirs, rhodesiense HAT is targeted for elimination as a public health problem rather than for interruption of transmission; however, occasional human cases and localized outbreaks remain possible. This case report describes the clinical course of a traveler who developed symptoms and signs of rhodesiense HAT after returning to the United States from Zimbabwe.

Case Report and Outcome

In August 2024, CDC was contacted regarding diagnosis and management of a case of HAT caused by *T.b. rhodesiense* in a U.S. traveler aged 57 years who had recently returned from safari in the Zambezi Valley in northern Zimbabwe. The patient was evaluated at a U.S. hospital with a 2-day history of fever and a well-demarcated, ulcerated lesion on the left thigh, approximately 2 weeks after presumed exposure to *T.b. rhodesiense* parasites in an endemic area. He had no neurologic symptoms. A peripheral blood smear, obtained to rule out malaria, revealed parasites consistent with *Trypanosoma brucei* spp., which was confirmed by CDC's reference laboratory.§ The patient's presenting signs and symptoms and epidemiologic exposure risk were consistent with rhodesiense HAT.

In accordance with WHO guidelines, oral fexinidazole was initiated (*3*). The patient rapidly progressed to multisystem organ failure requiring dialysis and intubation for respiratory distress in the setting of volume overload. Intramuscular pentamidine, an alternative anti-trypanosomal drug that can be used in first stage disease, was added given the uncertainty of fexinidazole absorption by feeding tube. Intravenous suramin, used as first-line treatment for first stage rhodesiense HAT prior to the new guidelines in 2024, is relatively contraindicated in renal impairment.¶ The patient remained at neurologic baseline throughout his clinical course, although severe thrombocytopenia, a known complication of rhodesiense HAT, precluded lumbar puncture to confirm absence of CNS involvement (i.e., second stage disease). Ultimately, the patient received 10 days of pentamidine and fexinidazole and was discharged home with only mild renal dysfunction. No signs of relapse were evident 6 months after discharge.

Preliminary Conclusions and Actions

Between this patient's presentation in August 2024 and January 2025 three additional cases of rhodesiense HAT were reported to WHO in persons from nonendemic countries who were bitten by a tsetse fly while traveling in the Zambezi Valley. The Zambezi Valley spans northern Zimbabwe and southern Zambia, where epidemiologic conditions are similar, and the parasite is endemic. These four cases are the first Zambezi

* Although largely asymptomatic in indigenous animals, infection can produce fever, itching, and lymphadenopathy in the first stage, followed by sleep disturbances, poor coordination, and behavior changes in the second stage.

† According to WHO, rhodesiense HAT is endemic in Botswana, Burundi, Eswatini, Ethiopia, Kenya, Malawi, Mozambique, Namibia, Rwanda, Tanzania, Uganda, Zambia, and Zimbabwe.

§ The presence of trypanosomes was confirmed by microscopy.

¶ Intravenous suramin is another therapeutic option but can result in renal toxicity; its use is therefore to be avoided in patients with renal impairment. https://reference.medscape.com/drug/suramin-sodium-suramin-342671#5

BOX. Epidemiologic characteristics of human African trypanosomiasis (sleeping sickness) caused by infection with *Trypanosoma brucei rhodesiense*

Parasitic Sub-species
Trypanosoma brucei rhodesiense

Geographic location
East and southern Africa

Cases reported in Africa (2023)
Twenty-four reported in four countries (Ethiopia, Malawi, Tanzania, and Zambia)

Risk factors
Travel to wildlife preservations (national parks and game reserves) or game hunting; for local populations, hunting, herding, and cattle raising

Vector
Tsetse fly (*Glossina spp.*)

Primary reservoir
Domestic cattle, some big-game and safari animals (impala, lion, waterbuck, zebra, giraffe, warthog, and others)

Incubation period
Weeks to months

Prevention
- Wear thick, neutral-color clothing, including long pants, long-sleeved shirts, and socks as tsetse flies are attracted to bright and contrasting colors
- Inspect vehicles for tsetse flies before entering
- Avoid bushes

Frequency in persons for countries without endemic disease
Occasional cases among returning travelers (especially those having visited safari parks or game hunters)

Valley–associated cases reported since 2019, although Zambia has experienced human cases in other areas during this period.

Clinicians should urgently consider HAT caused by *T.b. rhodesiense* in travelers with fever arriving from an endemic area, even if cases have not been reported from that area recently. Delayed treatment can be fatal, so if rhodesiense HAT is suspected, clinicians should promptly obtain a peripheral blood smear to assess for trypanosomes and consider contacting CDC if diagnostic confirmation or treatment recommendations are needed. 2024 WHO guidelines recommend fexinidazole as first-line treatment for both first and second stage rhodesiense HAT with frequent post-treatment monitoring (*3*). Clinicians requiring assistance with diagnosis or treatment may contact CDC subject matter experts at parasites@cdc.gov or +1-404-718-4745.

Summary

What is already known about this topic?

Sleeping sickness or human African trypanosomiasis (HAT) is a rare and fatal disease, if left untreated, that is endemic in sub-Saharan Africa.

What is added by this report?

A U.S. traveler returning from Zimbabwe in August 2024 developed rhodesiense HAT and was successfully treated after prompt diagnosis. Three additional cases in persons from other countries who traveled to the same region were reported to the World Health Organization. These are the first Zambezi Valley–associated cases reported since 2019.

What are the implications for public health practice?

Clinicians should consider rhodesiense HAT in travelers with fever who have recently been in an area where *T.b. rhodesiense* is endemic, even if that area has not reported recent cases of disease. Timely treatment is critical to a favorable outcome.

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